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What is claimed is :

1 1. A chemical composition for dissolving silicon carbide, quartz, aluminum
2 oxide, or zirconium, comprising equal amounts by volume of sulfuric acid, hydrogen
3 fluoride, and nitric acid.

1 2. A method of analyzing contaminants adhering to a sample taken from
2 semiconductor device fabrication equipment comprising:

3 a) immersing the sample in a chemical composition comprising equal amounts by
4 volume of sulfuric acid, hydrogen fluoride, and nitric acid;

5 b) dissolving the sample in the chemical composition;

6 c) cooling the dissolved sample to room temperature;

7 d) diluting the dissolved sample with deionized water; and

8 e) analyzing the diluted sample.

1 3. The method of claim 2, further comprising after said cooling, removing any
2 fumes contained in the dissolved sample.

1 4. The method of claim 3, wherein said removing further comprises irradiating
2 infrared light onto the dissolved sample surface using an infrared lamp in order to

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3 increase the temperature of the dissolved sample thereby causing any fumes in the
4 dissolved sample to evaporate.

1 5. The method of claim 4, wherein during said removing, the temperature of the
2 dissolved sample is increased to between about 60°C and 80°C by irradiating the sample
3 with the infrared lamp.

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1 6. The method of claim 2, wherein the immersing further comprises,
2 (a) adding the chemical composition and the sample to a sample container,
3 (b) sealing the sample container,
4 (c) placing the sealed sample container in a pressure container for further sealing,
5 (d) placing the pressure container into a temperature-variable dry oven, and
6 (e) raising the temperature in the dry oven to thereby heat the chemical and the
7 sample in the sample container.

1 7. The method of claim 6, wherein said raising the temperature further comprises,
2 (a) increasing the inner temperature of the dry oven sequentially to a first lower
3 inner temperature and then to a second higher inner temperature, and
4 (b) maintaining the second higher inner temperature for a predetermined period
5 of time that permits the sample to dissolve.

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1 8. The method of claim 7, wherein the first lower inner temperature is in a range
2 of from about 100°C to about 140°C.

1 9. The method of claim 7, wherein the second higher inner temperature is in a
2 range of from about 200°C to about 260°C.

1 10. The method of claim 7, wherein said increasing of the inner temperature of
2 the dry oven to the second higher inner temperature is performed with a temperature
3 cycling sequence comprising,

4 (a) increasing the inner temperature of the dry oven for about 140 to 160 seconds
5 after the first lower inner temperature has been reached, until an intermediate
6 temperature is reached, the intermediate temperature being above the first lower
7 inner temperature and below the second higher inner temperature;

8 (b) maintaining the first intermediate temperature reached in (a) for 3 to 6
9 seconds;

10 (c) decreasing the inner temperature of the dry oven for 45 to 55 seconds;

11 (d) increasing the inner temperature of the dry oven for about 140 to 160 seconds
12 until another higher intermediate temperature is reached;

13 (e) maintaining the higher intermediate temperature reached in (d) for 3 to 6

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- 14 seconds;
- 15 (f) decreasing the inner temperature of the dry oven for 45 to 55 seconds;
- 16 (g) repeating (d), (e) and (f) until the second higher inner temperature is reached.

1 11. The method of claim 2, wherein the sample contains one of silicon carbide,
2 quartz or zirconium.

1 12. The method of claim 11, wherein the second higher inner temperature is
2 maintained for about 22 to 26 hours to dissolve the sample.

1 13. The method of claim 2, wherein the cooling of the dissolved sample further
2 comprises, decreasing the inner temperature of the dry oven, and removing the pressure
3 container from the dry oven.

1 14. The method of claim 13, wherein decreasing the inner temperature of the dry
2 oven is carried out for 20 to 40 minutes.

1 15. The method of claim 2, wherein said diluting is achieved by making a
2 solution of about 10 to 20 weight percent of the dissolved sample and about 80 to 90
3 weight percent of deionized water.

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1 16. The method of claim 2, wherein the analyzing is accomplished using an
2 Atomic Absorption Spectrometer.

1 17. The method of claim 2, wherein the analyzing is accomplished using an
2 Atomic Emission Spectroscope.

1 18. The method of claim 2, wherein during said immersing, about 0.1 to 0.3 g of
2 the sample is immersed in about 10 to 20 ml of the chemical composition.

1 19. The method of claim 7, wherein the sample is aluminum oxide.

1 20. The method of claim 19, wherein the second higher inner temperature is
2 maintained for about 45 to 55 hours to dissolve the sample.

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